

Serina L. Robinson

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EDUCATION

- 2016 – 2020 | **Ph.D., Microbiology**
University of Minnesota – Twin Cities, Minneapolis, MN, USA
- 2018 – 2020 | **M.Sc., Bioinformatics and Computational Biology**
University of Minnesota – Twin Cities, Minneapolis, MN, USA
- 2011 – 2015 | **B.A., Chemistry, B.A. Norwegian, *summa cum laude***
Saint Olaf College, Northfield, MN, USA

CAREER

- 2021 – Present | **Research Group Leader, Tenure-track**
Department of Environmental Microbiology
Swiss Federal Institute of Aquatic Science and Technology, Dübendorf, Switzerland
- 2020 – 2021 | **ETH Postdoctoral Research Fellow**
Advisor: Dr. Jörn Piel, Institute of Microbiology
Eidgenössische Technische Hochschule (ETH) Zurich, Zurich, Switzerland

RESEARCH INTERESTS

microbial specialized metabolism, enzyme discovery, synthetic biology, microbial ecology, bioinformatics

PUBLICATIONS & PATENTS

Patents:

1. **Robinson, S. L.**, Christenson, J.K. & Wackett, L.P. Biological production of β -lactones. U.S. Patent Application. 16/510,298, filed February 13, 2020.

Publications:

*denotes corresponding authorship

1. **Robinson, S.L.***, Piel, J., & Sunagawa, S. A. (2021) A roadmap for metagenomic enzyme discovery. *Natural Product Reports*. [E-pub ahead of print]. doi: [10.1039/D1NP00006C](https://doi.org/10.1039/D1NP00006C).
2. Paoli, L., Ruscheweyh, H.J., Forneris, C.C., Kautsar, S., Clayssen, Q., Salazar, G., Milanese, A., Gehrig, D., Larralde, M., Carroll, L., Sanchez, P., Zayed, A.A., Cronin, D.R., Acinas, S.G., Bork, P., Bowler, C., Delmont, T.O., Sullivan, M.B., Wincker, P., Zeller, G., **Robinson, S.L.**, Piel, J.P., Sunagawa, S. (2021) Uncharted biosynthetic potential of the ocean microbiome. *bioRxiv*. doi: [10.1101/2021.03.24.436479v1](https://doi.org/10.1101/2021.03.24.436479v1).
3. **Robinson, S.L.**, Biernath, T., Rosenthal, C., Young, D., Wackett, L.P., & Martinez-Vaz, B.M. (2021) Development of the organonitrogen biodegradation database: teaching bioinformatics and collaborative skills to undergraduates *Journal of Biology & Microbiology Education*. 22(1), ev22i1.2351. doi: [10.1128/jmbe.v22i1.2351](https://doi.org/10.1128/jmbe.v22i1.2351).
4. Tracanna, V., Ossowicki, A., Petrus, M.L.C., Overduin, S., Terlouw, B.R., George Lund, G., **Robinson, S.L.**, Warris, S., Schijlen, E.G.W.M., van Wezel, G.P., Raaijmakers, J.M., Garbeva, P., & Medema, M.H. (2021) Dissecting disease-suppressive rhizosphere microbiomes by functional amplicon sequencing and 10X metagenomics. *mSystems*. 6(3), e01116-20. doi: [10.1128/mSystems.01116-20](https://doi.org/10.1128/mSystems.01116-20).
5. Jackson, K., Pelletier, K., Scheftel, J., Kerkaert, J., **Robinson, S.L.**, McDonald, T., Bender, J., Knight, J., Ireland, M., & Nielsen, K. (2021) *Blastomyces dermatitidis* environmental prevalence in Minnesota:

- analysis and modeling using soil collected at basal and outbreak sites. *Applied and Environmental Microbiology*. 87, 5. doi: [10.1128/AEM.01922-20](https://doi.org/10.1128/AEM.01922-20).
6. **Robinson, S.L.**,* Terlouw, B.R., Smith, M.D., Pidot, S.J., Stinear, T.P., Medema, M.H. & Wackett, L.P. (2020) Global analysis of adenylate-forming enzymes reveals β -lactone biosynthesis pathway in pathogenic *Nocardia*. *Journal of Biological Chemistry*. 295(44), 14826-14839. doi: [10.1074/jbc.RA120.013528](https://doi.org/10.1074/jbc.RA120.013528).
 7. Wackett, L.P. & **Robinson, S.L.** (2020) The ever-expanding limits of enzyme catalysis and biodegradation: polyaromatic, polychlorinated, polyfluorinated, and polymeric compounds. *Biochemical Journal*. 477(15), 2875–2891. doi: [10.1042/BCJ20190720](https://doi.org/10.1042/BCJ20190720).
 8. **Robinson, S.L.**, Smith, M.D., Richman, J.E., Aukema, K.G., & Wackett, L.P. (2020) Machine learning-based prediction of activity and substrate scope for OleA enzymes in the thiolase superfamily. *Synthetic Biology*. doi: [10.1093/synbio/ysaa004](https://doi.org/10.1093/synbio/ysaa004).
 9. Smith M.D., **Robinson S.L.**, Molomjamts M.M., & Wackett L.P. (2020) *In vivo* assay reveals microbial OleA thiolases initiating hydrocarbon and β -lactone biosynthesis. *mBio*. 11(2). doi: [10.1128/mBio.00111-20](https://doi.org/10.1128/mBio.00111-20).
 10. Aukema, K.G., Tassoulas, L.J., **Robinson, S.L.**, Konopatski, J.F., Bygd, M.D., & Wackett, L.P. (2020) Cyanuric acid biodegradation via biuret: physiology, taxonomy, and geospatial distribution. *Applied and Environmental Microbiology*, 86(2), e01964-19. doi: [10.1128/AEM.01964-19](https://doi.org/10.1128/AEM.01964-19).
 11. Kautsar, S.A., Blin, K., Shaw, S., Navarro-Muñoz, J.C., Terlouw, B.R., van der Hoof, J.J., van Santen, J., Tracanna, V., Suarez Duran, H.G., Andreu, V.P., Selem-Mojica, N., Alanjary, M., **Robinson, S.L.**, Lund, G., Epstein, S.C., Sisto, A.C., Charkoudian, L.K., Collemare, J., Linington, R., Weber, T., & Medema, M.H. (2019) MIBiG 2.0: A repository for biosynthetic gene clusters of known function. *Nucleic Acids Research* 48(D1), D454–D458 doi: [10.1093/nar/gkz882](https://doi.org/10.1093/nar/gkz882).
 12. **Robinson, S.L.**, Christenson, J.K., Richman, J.E., Jenkins, D.J., Neres, J., Fonseca, D.R., Aldrich, C.C., & Wackett, L.P. (2019) Mechanism of a standalone β -lactone synthetase: new continuous assay for a widespread ANL superfamily enzyme. *ChemBioChem* 20, 1701-1711. doi: [10.1002/cbic.201800821](https://doi.org/10.1002/cbic.201800821).
 13. Tveit, A.T., Hestnes A.G., **Robinson, S.L.**, Schintlmeister, A., Dedysh, S., Jehmlich, N., von Bergen, M., Herbold, C., Wagner, M., Richter A., & Svenning M.M. (2019) Widespread soil bacterium that oxidizes atmospheric methane. *Proceedings of the National Academy of Sciences* 116(17), 8515-8524. doi: [10.1073/pnas.1817812116](https://doi.org/10.1073/pnas.1817812116). *Winner of the 2019 Cozzarelli Prize in Biomedical Sciences
 14. **Robinson, S.L.** & Wackett, L.P. Rings of power: enzymatic routes to β -lactones. (2019) In *Comprehensive Natural Products III: Chemistry and Biology, Enzymes and Enzyme Mechanisms*.
 15. **Robinson, S.L.**, Christenson, J.K., & Wackett, L.P. (2018) Biosynthesis and chemical diversity of β -lactone natural products. *Natural Product Reports* 36(3), 458-475. doi: [10.1039/C8NP00052B](https://doi.org/10.1039/C8NP00052B).
 16. **Robinson, S.L.**, Badalamenti, J. P., Dodge, A.G., Tassoulas, L.J., & Wackett, L.P. (2018) Microbial biodegradation of biuret: defining biuret hydrolases within the isochorismatase superfamily. *Environmental Microbiology* 20(6), 2099-2111. doi: [10.1111/1462-2920.14094](https://doi.org/10.1111/1462-2920.14094).
 17. **Robinson, S.L.** & Wackett, L.P. (2018) Diversity and taxonomy of aliphatic hydrocarbon producers. *Handbook of Hydrocarbon and Lipid Microbiology Series*, Springer-Nature, 1-20.
 18. Wackett, L.P. & **Robinson, S.L.** (2018) The future of environmental microbiology. *Environmental Microbiology* 20(6), 1988–1990. doi: [10.1111/1462-2920.14256](https://doi.org/10.1111/1462-2920.14256).
 19. Vergauwen, L., Cavallin, J.E., Ankley, G.T., Bars, C., Gabriëls, I.J., Michiels, E.D.G., Fitzpatrick, K.R., Periz-Stanacev, J., Randolph, E.C., **Robinson, S.L.**, Saari, T.W., Schroeder, A.S., Stinckens, E., Swintek, J., Van Cruchten, S.J., Verbeuken E., Villeneuve, D.L., & Knapen, D. (2018) Gene transcription ontogeny of hypothalamic-pituitary-thyroid axis development in early-life stage fathead minnow and zebrafish. *Gen. Comp. Endocrinology* 266, 87-100. doi: [10.1016/j.ygcen.2018.05.001](https://doi.org/10.1016/j.ygcen.2018.05.001)

20. Christenson, J.K., **Robinson, S.L.**, Engel, T.A., Richman, J.E., & Wackett, L.P. (2017) β -Lactone decarboxylase: function, mechanism, and linkage to class III haloalkane dehalogenases. *Biochemistry** 56(40), 5278–5287. doi: [10.1021/acs.biochem.7b00667](https://doi.org/10.1021/acs.biochem.7b00667).
*Highlighted in *Science* as an Editor's Choice, 358(6367), 1144. doi: [10.1126/science.358.6367.1144](https://doi.org/10.1126/science.358.6367.1144).
21. Schulfer, A.F., Battaglia T., Alvarez, Y., Bijnens, L., Ruiz, V. E., Ho, M., **Robinson, S.L.**, Ward, T.W., Cox, L.M., Rogers, A.B., Knights, D., & Blaser, M.J. (2017) Intergenerational transfer of antibiotic-perturbed microbiota enhances colitis in susceptible mice. *Nature Microbiology* 3(2), 234. doi: [10.1038/s41564-017-0075-5](https://doi.org/10.1038/s41564-017-0075-5).
22. LaLone, C.A., Villeneuve, D.L., Lyons, D., Helgen, H.W., **Robinson, S.L.**, Swintek, J.A., Saari, T.W., & Ankley, G.T. (2016) Sequence alignment to predict across species susceptibility (SeqAPASS): a web-based tool for addressing the challenges of cross-species extrapolation of chemical toxicity. *Toxicological Sciences* 153(2), 228-245. doi: [10.1093/toxsci/kfw119](https://doi.org/10.1093/toxsci/kfw119).

FELLOWSHIPS & GRANTS

- 2021 – 2023 | Eawag Discretionary Project Funding
- 2020 – 2021 | ETH Zurich Postdoctoral Fellowship in lab of Dr. Jörn Piel, Institute of Microbiology
- 2020 Human Frontiers in Science Long-Term Fellowship
Awarded but declined to accept ETH Zurich postdoctoral fellowship
- 2015 – 2020 | National Science Foundation Graduate Research Fellowship
- 2019 | National Science Foundation Graduate Research Opportunities Worldwide Fellowship
Host: Dr. Marnix Medema, Wageningen University & Research, Wageningen, the Netherlands
- 2018 | University of Minnesota Informatics Institute Updraft Grant
Host: AgBiome, LLC, Research Triangle Park, NC, USA
- 2015 – 2016 | Fulbright Research Scholarship
Host: Dr. Mette M. Svenning, UiT: the Arctic University of Norway, Tromsø, Norway
- 2013 – 2015 | U.S. Environmental Protection Agency Greater Research Opportunities Fellowship
Host: U.S. Environmental Protection Agency Mid-continent Ecology Division laboratory

SELECTED PRESENTATIONS

1. **Robinson, S.L.**, Christenson, J.K., Terlouw, B.R., Medema, M.H. & Wackett, L.P. (Invited talk, August 2020) *Machine learning-guided insights into antibiotic biosynthesis*. 7th Annual UMN Bioinformatics and Computational Biology Industry Symposium. Online conference.
2. **Robinson, S.L.**, Christenson, J.K., Terlouw, B.R., Medema, M.H. & Wackett, L.P. (Invited talk, February 2020). *Genome mining-guided insights into β -lactone natural product biosynthesis*. Gordon Research Seminar and Gordon Research Conference. Marine Natural Products, Ventura, CA, USA.
3. **Robinson, S.L.**, Christenson, J.K., Terlouw, B.R., Medema, M.H. & Wackett, L.P. (Invited talk, May 2019). *β -Lactones as intermediates in natural product biosynthesis*. Novo Nordisk Bioscience Conference. Natural Products - Discovery, Biosynthesis and Application. Hillerød, Denmark.
4. **Robinson, S.L.**, Christenson, J.K., & Wackett, L.P. (July 2018). *Harnessing β -lactone synthetase diversity to design custom natural products*. Poster. Gordon Research Conference on Natural Products and Bioactive Compounds. Proctor Academy, New Hampshire, USA.
5. **Robinson, S.L.**, Christenson, J.K., & Wackett, L.P. (January 2018). *Discovery of a novel β -lactone synthetase reveals biosynthetic origins of long-chain natural products including the nocardiolactones*. Poster. Keystone Symposium: Natural Products & Synthetic Biology. Olympic Valley, CA, USA.
6. **Robinson, S.L.**, Christenson, J.K., & Wackett, L.P. (July 2017). *Genome mining to predict β -lactone and olefin biosynthesis*. Poster.* Society in Industrial Microbiology and Biotechnology (SIMB) Annual Meeting. Denver, CO, USA. *Carol D. Litchfield Best Student Poster Award Winner, Natural Products

7. **Robinson, S.L.**, Hestnes, A.G., Tveit, A., & Svenning, M.M. (August 2016). *Characterization of a novel obligate methanotroph within Beijerinckiaceae closely related to Upland Soil Cluster alpha*. Poster. 16th International Symposium on Microbial Ecology (ISME 16), Montreal, Canada.
8. **Robinson, S.L.**, Hall-Holt, O., & Sanft, K. (Invited talk, March 2015). *Statistics-infused introduction to computer science*. Special Interest Group on Computer Science Education. Kansas City, MO, USA.

AWARDS & HONORS

- 2021: Lorentz Center Chemistry Competition team award for best workshop proposal in 2020
- 2020: Beatrice Z. Milne and Theodore Brandenburg Award for outstanding PhD thesis research
- 2020: Dr. Marvin and Hadassah Bacaner Award for outstanding PhD thesis research
- 2019: National Academy of Sciences Cozzarelli Prize for biomedical category paper in *PNAS*
- 2019: MICaB Chen Award for outstanding graduate research
- 2019: Golden Pipetman Award for outstanding graduate research
- 2018: Biocatalysis and Biotechnology Poster Award Winner, IPRIME conference
- 2017: Carol D. Litchfield Best Student Poster Award Winner, Natural Products, SIMB conference
- 2015: HyperCube Scholar Molecular Modeling Award
- 2012 – 2014: Arnold and Mabel Beckman Foundation Research Scholar
- 2011: National Merit Scholar Finalist

PROFESSIONAL DEVELOPMENT & COMMUNITY OUTREACH

- 2021: Lorentz Center scientific workshop co-organizer, scheduled for October 2021 in Leiden, NL
 - Workshop topic: 'Artificial intelligence for natural product drug discovery'
- 2020: Main organizer for 'Microbial specialized metabolism' symposium in Zurich, CH
- 2019: Machine learning workshop, rstudio::conf, Austin, TX, USA
- 2018 – 2020: BioTechnology Institute MicrobeTech seminar organizer
- 2018 – 2020: Microbiology Career Development Committee main event organizer
- 2017 – 2018: Women in Technology (WiT) mentoring program
- 2017: Data Carpentry workshop volunteer – assisted in teaching R, shell scripting, data mining
- 2016 – 2018: Women Who Code and R Ladies participant

TEACHING

Courses taught/assisted:

- 2021: P GL Bio I - FS21 *Microbiology*, laboratory lecturer, ETH Zurich, Switzerland
- 2017 – 2018: *Biology of Microorganisms* (MicB 3301), laboratory lecturer, University of Minnesota
- 2014 – 2015: *Computer Science for Scientists* (CSCI 125), designed curriculum/group projects

MENTORING

Mentored students:

Student	Education stage	University	Current position
Dom Jenkins	Undergraduate	Northwestern College	Research technician, Harvard University
Dallas Fonseca	PhD rotation	University of Minnesota	PhD student, University of Minnesota
Maya Burroughs	MSc rotation	University of Minnesota	Research scientist, Stratix Labs Co.
Samantha Ealy	Undergraduate	Hamline University	Research associate, Bio-Techne, LLC
Megan Smith	PhD rotation	University of Minnesota	PhD student, University of Minnesota
Troy Biernath	Undergraduate	Bethel University	Research Associate, University of Minnesota

INDUSTRY EXPERIENCE

- 2018: Internship with AgBiome, LLC, agromicrobiome startup, Research Triangle Park, NC, USA
- 2018: BASF Industry Summer Course, BASF headquarters, Ludwigshafen, Germany

IN THE NEWS

- ASM article feature: [Remote undergrad research project builds multiple skills](#) (11 May 2021)
- ETH Zurich News: [A simple exterior – but complex interior](#) (6 May 2021)
- *PNAS* Science Sessions Podcast: [Soil bacterium that lives on air](#) (17 Aug 2020)
- Research highlight, *Nature* reviews: [A mother's microbiota: intergenerational transfer](#) (Dec 2017)
- Research highlight, *Science* as Editor's Choice: [An enzymatic route to alkenes](#) (1 Dec 2017)

PROFESSIONAL MEMBERSHIPS & AFFILIATIONS

- 2017 Society for Industrial Microbiology and Biotechnology (SIMB)
- 2016 International Society for Microbial Ecology (ISME)
- 2015 American Society for Biochemistry and Molecular Biology (ASBMB)
- 2013 American Geophysical Union (AGU)

LANGUAGES

- English: Native speaker
- Norwegian: C2 (fluent), spoken and written
- German: A2, spoken and written